Amrut Sevabhavi Sanstha, Parbhani.

#### Late Ku. Durga K. Banmeru Science College, Lonar Dist-Buldhana.

# Department of Electronics

**Teaching Plan 2017-18** 

#### Class:-B.Sc. IstYear Semester:- Ist

#### **Paper:- Basic Of Electronics(CBCS)**

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Passive component and		
1			Network Theorems		
			Introduction to Resistors,		
			Capacitors, Inductors and	04	
			Transformers,		
			Concept of ideal dc voltage and		
			current source,	02	15
			KVL, KCL,	02	
			Thevenin's, Norton's,	07	
			maximum power transfer,		
			Millman's theorem (statement,		
			proof, simple numerical		
			application for dc only).		
2	Aug-	Unit II	Measuring Instruments		
	Sept		Principles of voltmeter, ammeter, ohmmeter,	03	
			Multirange DC voltmeter,		
			ohm per volt rating, loading effect, Multirange DC Ammeter, Series & shunt type ohmmeter,	04	15
			Multimeter (uses & drawback).	04	
			CRO Block diagram & explanation, CRT		
			construction & working, uses of CRO (measurement of frequency, amplitude& phase.)	04	
3	Sept	Unit III	Semiconductor Diode and Regulated power		
	_		supply:		
			Operation and characteristics of PN junction diode, Avalanche and Zener breakdown mechanism,	0.4	
			Half wave and full wave rectifiers (ripple factor,	04	
			efficiency, PIV ratings), C, L and p filters,	03	
			Concept of unregulated and regulated power	03	15
			supply, Zener diode voltage regulator,	02	
			Three terminal IC regulator.	03	

#### Class:-B.Sc. IstYear

			Class:-B.Sc. 1° Year		,
4	Oct	Unit IV	•		
			NPN and PNP transistor (construction and working) CB, CE & CC configuration, leakage currents,	05	
			Input and output characteristics of CE mode,	03	15
			relation between $\alpha$ and $\beta$ Load line and operating point,	02	
			Amplification action of CE amplifier, biasing and	02	
			stability, Self and fixed bias circuit.	04	
	Nov.	Unit V	Switching and Optoelectronic devices:		
5			Construction, working and characteristics of FET,		
			MOSFET, UJT, SCR, relation of FET parameters,	08	
			Construction, working & characteristics of LDR,	02	15
			LED, photodiode, photovoltaic cell( Solar cell).	05	
6	Dec.	Unit VI	Integrated Circuits:		
			Introduction to IC technology, advantages and		
			disadvantages,	03	
			Classification of ICs,	02	
			Basic steps in fabrication of monolithic ICs,	02	15
			Fabrication of diode, resistor & transistor.	03	
			Scale of integration upto V2LSI',	02	
			Basic concept of Embedded systems.	03	

#### Class:-B.Sc. I<sup>st</sup>Year Semester:- II<sup>nd</sup>

#### Paper:- Digital Electronics(CBCS)

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan-	Unit. I	Binary Arithmetic & Logic gates :		
	Feb		Binary, Octal & Hexadecimal number system and their interconversion,	07	
			Binary arithmetic (addition and subtraction using 1's & 2's compliment),	01	15
			multiplication & division. Binary codes: 8421 BCD, Excess-3 & Gray code. NOT, OR, AND, NAND, NOR gates (definition and truth table). EXNOR & EXOR gates,	05	
			Half adder, full adder, 4 bit binary full adder.	02	
2	Feb-	Unit II	Boolean Algebra & Logic families:		
	Mar		Boolean laws, De-morgans theorem,	02	
			Simplification of Boolean equations using Boolean algebra, Fundamental products & sum terms, K-map (K-map upto 4 variable).	07	15
			Classification of logic families, characteristics (Fan- in, Fanout, Noise immunity, Propogation delay, Power dissipation),	03	
2	<b>M</b> - ::	TT *4	DTL,TTL & CMOS logic.	03	
3	Mar	Unit III	Multivibrators and Flip Flops: Construction & working of Astable, monostable and Bistable transistorised multivibrators, RS, CK-RS, D, JK, JKMS and T Flip Flops (Logic diagram, Truth table, construction & working),	05	15
			Concept of edge trigger Flip-Flop, Concept of preset & clear terminal.	05	
			& Clear terminar.	05	
4	Mar-	Unit	Counters and Shift registers:		
	Apr	IV	Asynchronous & synchronous Counter, Up-down counters (up to 4-bits),	04	
			modified asynchronous counter (Mod -7 ,Mod10,and Mod-13). Types of shift registers,	03	15
			SISO, SIPO, PISO & PIPO, IC version of Mod -10 shift registers (Construction & working),	04	
			IC version of shift register – 7495, Application of shift register. Ring counter, Johnson's counter.	04	

#### Class:-B.Sc. IstYear

#### Semester:- II<sup>nd</sup>

			Schiester - 11		
5	Apr- May	Unit V	Combinational logic circuit: Encoder: Binary to BCD, Decimal to BCD, IC 74147, Decoder: 2 to 4 line, BCD to decimal, BCD to 7 segment, IC 7447, Multiplexer: 4X1, 8X1, De multiplexer: 1X4, 1X8, (Definition, construction, operation and application of above)	05 02 03 05	15
6	Apr-	Unit	Semiconductor Memories:		
0	-	VI	Concept of memory, primary and secondary memory,		
	May	V1	classification of memories, volatile and non volatile memories, memory	04	15
			Hierarchy, semiconductor memory: RAM, ROM, PROM,	02	
			EPROM, EEPROM, flash memory.	02	

## Class:-B.Sc. II nd Year

## $\begin{tabular}{ll} \textbf{Semester:-} & III^{rd} \\ \textbf{Paper:-} & \textbf{Electronics Devices and Circuits} \\ \end{tabular}$

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Hybrid-parameters & Cascaded		
1			amplifiers:		
			Hybrid-parameters, transistor		
			equivalent circuit of CE,CB,		
			Analysis of small signal CE		15
			amplifiers,	07	10
			Concept of cascaded amplifier,	02	
			Types of coupling, RC Coupled		
			Amplifier, Single Tuned		
			amplifiers,	06	
2	Aug-	Unit II	Power Amplifier:		
	Sept		Classification of power amplifier, Class A, Class B, Class C and Class AB amplifiers,	05	
			Class A - transformer coupled amplifier, Class-B push-pull amplifier (Construction, working and efficiency of each).	05	15
			Distortion, complementary symmetry Class-B push- pull amplifier.	05	
2	C1	Unit III	E. J 1		
3	Sept	Omt III	Feedback amplifiers and Oscillators: Concept of feedback, feedback theory, positive and negative feedback,	03	
			advantage of negative feedback, physical idea of		15
			feedback,(Block diagram only), concept of oscillator, basic elements of oscillator,	03	
			Barkhausen Criteria of oscillation, concept of tank circuit. RC oscillator-Phase shift and Wein bridge	02	
			oscillator, LC oscillator- Colpitts and Hartley oscillator, Crystal oscillator	07	
4	Oct	Unit IV	Operational amplifier and applications:		
			Difference amplifier(concept, construction and working),		
			block diagram of operational amplifier,	01	
			characteristics of ideal op amp, concept of virtual	03	15
			ground, parameter of op amp output impedance, Applications: Op amp as inverting and non		15
			inverting amplifier, adder, Subtractor, Differentiator and Integrator.	1	

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	Nov.	Unit V	Advance applications of Op- Amp:		
5			Solution to simultaneous equation, differential		
			equation for harmonic, damped harmonic oscillator, regenerative	04	1.5
			comparator, logarithmic amplifier,	04	15
			Astable, Monostable and Bistable multivibrator and		
			its time period (construction and working).	07	
	Nov-	Unit	A/D and D/A converter:		
6	Dec	VI	Need of A/D and D/A converter.	02	
			D/A converter: R-2R ladder type, Weighted resistor,		
			sample and hold circuit,	04	15
			IC ADC, DAC specification.	02	
			A/D converter: Single and Dual slope, counter type, successive approximation type, specification,		
			Numerical based on A/D and D/A Converter	07	

#### Class:-B.Sc. II<sup>nd</sup> Year Semester- IV<sup>th</sup>

## $B.Sc. \,\, II^{\,\, nd} \,\, Year$ Paper:- Communication Electronics and Microprocessor 8085

Unit II	Modulation and Demodulation: Need for modulation, AM theory, Power relation, Theory of FM, Numerical on AM and AM Systems, frequency spectrum of FM. Generation of AM and FM. Collector modulator, diode reactance modulator. Demodulator: diode detector, slope detector. Transmitter and receiver: Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication: Introduction, advantages of OFC, Types of fibers, internal reflections, numerical aperature. Optical Sources: Semiconductor injection LASER, LED, (power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber alignment and joint losses, connector couplers.	03 03 03 02 04 02 03 04 03 03	15
Unit II	Need for modulation, AM theory, Power relation, Theory of FM, Numerical on AM and AM Systems, frequency spectrum of FM. Generation of AM and FM. Collector modulator, diode reactance modulator. Demodulator: diode detector, slope detector. Transmitter and receiver: Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication: Introduction, advantages of OFC, Types of fibers, internal reflections, numerical aperature. Optical Sources: Semiconductor injection LASER, LED, (power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	03 03 02 04 02 03 04 03	
	Theory of FM, Numerical on AM and AM Systems, frequency spectrum of FM. Generation of AM and FM. Collector modulator, diode reactance modulator. Demodulator: diode detector, slope detector. Transmitter and receiver: Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication: Introduction, advantages of OFC, Types of fibers, internal reflections, numerical aperature. Optical Sources: Semiconductor injection LASER, LED, (power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	03 03 02 04 02 03 04 03	
	Numerical on AM and AM Systems, frequency spectrum of FM.  Generation of AM and FM. Collector modulator, diode reactance modulator.  Demodulator: diode detector, slope detector.  Transmitter and receiver: Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication:  Introduction, advantages of OFC,  Types of fibers, internal reflections, numerical aperature.  Optical Sources: Semiconductor injection LASER,  LED, (power and efficiency chacteristics).  Optical detectors: Photodiode, PIN diode,  Phototransistor.  Optical fiber connection: Jointer and coupler, fiber	03 03 02 04 02 03 04 03	
	spectrum of FM . Generation of AM and FM . Collector modulator , diode reactance modulator . Demodulator: diode detector , slope detector. Transmitter and receiver :Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication : Introduction ,advantages of OFC , Types of fibers ,internal reflections ,numerical aperature. Optical Sources : Semiconductor injection LASER , LED ,(power and efficiency chacteristics). Optical detectors : Photodiode , PIN diode , Phototransistor . Optical fiber connection : Jointer and coupler ,fiber	03 02 04 02 03 04 03	
	Generation of AM and FM . Collector modulator , diode reactance modulator .  Demodulator: diode detector , slope detector.  Transmitter and receiver: Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication:  Introduction ,advantages of OFC ,  Types of fibers ,internal reflections ,numerical aperature.  Optical Sources: Semiconductor injection LASER ,  LED ,(power and efficiency chacteristics).  Optical detectors: Photodiode , PIN diode ,  Phototransistor .  Optical fiber connection: Jointer and coupler ,fiber	03 02 04 02 03 04 03	
	diode reactance modulator .  Demodulator: diode detector , slope detector.  Transmitter and receiver: Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication: Introduction ,advantages of OFC , Types of fibers ,internal reflections ,numerical aperature. Optical Sources: Semiconductor injection LASER , LED ,(power and efficiency chacteristics). Optical detectors: Photodiode , PIN diode , Phototransistor . Optical fiber connection: Jointer and coupler ,fiber	02 04 02 03 04 03	
	Demodulator: diode detector, slope detector.  Transmitter and receiver: Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication: Introduction, advantages of OFC, Types of fibers, internal reflections, numerical aperature. Optical Sources: Semiconductor injection LASER, LED, (power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	02 04 02 03 04 03	15
	Transmitter and receiver :Block diagram and working of AM and FM transmitter and receiver.  Fiber Optic Communication: Introduction ,advantages of OFC , Types of fibers ,internal reflections ,numerical aperature. Optical Sources : Semiconductor injection LASER , LED ,(power and efficiency chacteristics). Optical detectors : Photodiode , PIN diode , Phototransistor . Optical fiber connection : Jointer and coupler ,fiber	04 02 03 04 03	15
	of AM and FM transmitter and receiver.  Fiber Optic Communication: Introduction ,advantages of OFC , Types of fibers ,internal reflections ,numerical aperature. Optical Sources: Semiconductor injection LASER , LED ,(power and efficiency chacteristics). Optical detectors: Photodiode , PIN diode , Phototransistor . Optical fiber connection: Jointer and coupler ,fiber	02 03 04 03	15
	Fiber Optic Communication: Introduction, advantages of OFC, Types of fibers, internal reflections, numerical aperature. Optical Sources: Semiconductor injection LASER, LED, (power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	02 03 04 03	15
	Introduction ,advantages of OFC , Types of fibers ,internal reflections ,numerical aperature. Optical Sources : Semiconductor injection LASER , LED ,(power and efficiency chacteristics). Optical detectors : Photodiode , PIN diode , Phototransistor . Optical fiber connection : Jointer and coupler ,fiber	03 04 03	15
Unit III	Types of fibers ,internal reflections ,numerical aperature.  Optical Sources : Semiconductor injection LASER , LED ,(power and efficiency chacteristics).  Optical detectors : Photodiode , PIN diode , Phototransistor .  Optical fiber connection : Jointer and coupler ,fiber	03 04 03	15
Unit III	aperature. Optical Sources: Semiconductor injection LASER, LED, (power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	03 04 03	15
Unit III	aperature. Optical Sources: Semiconductor injection LASER, LED, (power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	04 03	15
Unit III	LED ,(power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	03	
Unit III	LED ,(power and efficiency chacteristics). Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	03	
Unit III	Optical detectors: Photodiode, PIN diode, Phototransistor. Optical fiber connection: Jointer and coupler, fiber	03	
Unit III	Phototransistor . Optical fiber connection : Jointer and coupler ,fiber		
Unit III	Optical fiber connection: Jointer and coupler, fiber		
Unit III	<del>-</del>	03	
Unit III	angiment and joint tosses ;connector couplers.		
	Pulse Modulation and Digital Communication:		
	Pulse Modulation, Sampling Theorem PAM, PWM		
	,PPM and PCM (Bandwith of PCM ,Quantizing		
	Noise),	08	
	Application of PCM, Multiplexing Principles: TDM		15
	and FDM, Comparison of FDM and TDM.	07	
Unit IV	Architecture and timings of 8085:		
	Evolution of microprocessor, microcomputer (Block		
	diagram with function of each block),	03	
	architecture of Intel 8085 microprocessor, function of	03	
	each block of 8085, Functional pin diagram and		
		07	15
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Unit V	Instruction and programming of 8085:		
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		02	
	machine language, assembly language program such	i l	
		07	
	Unit V	function of all pins of 8085, instruction format. Instruction cycle, fetch and execute operation, machine cycle and state, timing diagram of MOV and MVI instructions.  Unit V Instruction and programming of 8085: Addressing mode, classification of instruction set of 8085 with examples, concept of stack and stack pointer, PUSH and POP instruction, Concept of subroutine: CALL and RET instruction, Delay subroutine (using one register and register pair). Programming: Algorithm, Flowchart, Assembly and machine language, assembly language program such	function of all pins of 8085, instruction format. Instruction cycle, fetch and execute operation, machine cycle and state, timing diagram of MOV and MVI instructions.  Unit V Instruction and programming of 8085: Addressing mode, classification of instruction set of 8085 with examples, concept of stack and stack pointer, PUSH and POP instruction, Concept of subroutine: CALL and RET instruction, Delay subroutine (using one register and register pair). Programming: Algorithm, Flowchart, Assembly and machine language, assembly language program such

#### Class:-B.Sc. II nd Year

## Semester:- IV Paper: -:- Communication Electronics and Microprocessor 8085

	Month	Unit	Name of Unit & Topics	Required	
No				Lect.	Lect.
6	May	Unit. VI	Interfacing:	0.2	
			Basic interfacing concept,	02	
			memory mapped I/O and I/O		
			mapped I/O Schemes, data		
			transfer schemes.	03	
			8255PPI: block diagram,		15
			function of each block,		
			Functional pin diagram, ,		
			function of each pin, operating		
			modes of 8255PPI, control		
			word format in I/O and BSR	10	
			mode, illustrative example.	10	

### Class:-B.Sc. III<sup>rd</sup> Year

#### Semester-V<sup>th</sup>

#### **Paper:-Measuring Instruments**

1	Ana	l.		Lect.	Lect.
1	Aug	Unit. I	Basic Instrumentation:		
	8		Block diagram of generalized instrumentation system, Concept of transducers (Primary and secondary, active and passive, analog and digital).	05	
			Resistive transducer potentiometer, Inductive transducer - LVDT, capacitive transducer (by		15
			changing distance), measurement of displacement using capacitive	05	
			transducer (By changing dielectric).	05	
2	Aug-	Unit II	Measurement of Temperature:	06	
	Sept		Thermocouple, Thermopile, Thermister, RTD, Total Radiation Pyrometer,	06	
			IC DS 1621, IC LM34, IC LM35,	03	15
			Infrared Pyrometer,	04	
_	α .	<b>T</b> T 4.	•	02	
3	Sept	Unit III	Timer and PLL: IC 555 timer: Block diagram and function of each block, application of 555 timer as astable, bistable and monostable multivibrator (construction, working and expression for time period).		
			PLL Block diagram and function of each block,	07	
			concept of capture range, pull in time, lock in range,	04	
			electrical characteristics, applications of PLL as FM		15
			demodulator, AM detector and frequency		
			synthesizer	04	
4	Oct	Unit IV	Display, digital Instrument		
			and ecorder:		
			Seven segment, 14 segment, dot		
			matrix, 16x2 LCD display,		
			advantage and disadvantage,	02	
			Digital instrument: Digital	03	
			frequency meter, Digital		
			voltmeter (Ramp type), Digital		15
			capacitance meter (Block		13
			diagram and function of each		
			block).	07	
			Recorder: Classification,	07	
			necessity of recorder, XY		
			recorder, magnetic tape		
			recorder.	0.7	
	Nov.	Unit V	Sensors and Actuators:	05	
5	. = . •	,	Sensors: Definition, Methods of fabrication of	08	
-			Sensors, Types of sensors (Mechanical, Thermal,		
			Optical, magnetic, chemical)		15
			Actuators: Definition, Working principles of		10
			Electromechanical, Electro thermal, Electro-optical and Electrochemical Actuators.	07	

	Nov.	Unit VI	Diometrical electromes.		
6			Introduction, Type of electrode, EEG, EMG, ECG- block diagram and function of each block, X ray machine, instantaneous heart rate meter-	06	
			systolic and diastolic blood pressure meter, EAR oximeter, pulse Oximeter, range gated pulse Doppler blood flow meter, Laser Doppler blood flow	03	15
			meter.	07	

#### Class:-B.Sc. III<sup>rd</sup> Year Semester-VI<sup>th</sup>

Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan- Feb	Unit. I	8086 Architecture: Block diagram of 8086 microprocessor, BIU and EU, operating modes of 8086, register of 8086-G.P.R, pointer and index register, segment register, concept of segmented memory, instruction pointer, status flag, pin diagram of 8086 microprocessor, physical and effective address.	07 08	15
2	Feb-	Unit II	Instructions and programming of 8086 Instructions:		
	Mar		MOV, PUSH, POP, LEA, LDS, LES,	04	
			Arithmetic & Logic Instructions. Addressing mode, 8086 instruction, Bus cycle,	03	15
3	Mar	Unit III	Programming: programs of data transfer, addition, subtraction, division, multiplication using various addressing mode.  8051 Microcontroller Architecture:	08	
3	iviai		Microcontroller Introduction, Difference between Microprocessor and Microcontroller,	0.5	
			block diagram of microcontroller, CPU, registers, flags,	05	15
			PSW, PC, Data Pointer, SFR, SP, Internal RAM/ROM, External memory, I/O ports, counter & timers, interrupts.	05 05	
4	Mar-	Unit IV	Instruction set of 8051 and Programming:		
	Apr		Addressing mode, Instruction set: Data transfer,		
			arithmetic, logical operation, JUMP, Loop and		
			CALL instructions.	08	15
			Assembly language programming examples:		13
			simple data transfer, arithmetic, logical and		
			single bit.	07	
_	Apr-	Unit V	8051 Interfacing & Application:		
5	May		Basics of serial communication, interfacing with RS-232C,	05	15
			SCON and PCON registers, interfacing a DAC / ADC and waveform generation,	05	
			interfacing to the 8255, interfacing LED, power reduction	05	
			mode.	05	

Semester-VI<sup>th</sup>
Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
6	May	Unit. VI	Advance microcontroller: Introduction to AVR, Arithmetic and logic Unit, program and data memories, downloadable flash program memory, SRAM data memory, general purpose register file, I/O register, EEPROM data memory, peripherals, Timers/ Counters.	04 02 05	15

Amrut Sevabhavi Sanstha, Parbhani.

#### Late Ku. Durga K. Banmeru Science College, Lonar Dist-Buldhana.

# Department of Electronics

**Teaching Plan 2018-19** 

#### Class:-B.Sc. IstYear Semester:- Ist

#### **Paper:- Basic Of Electronics(CBCS)**

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Passive component and		
1			Network Theorems		
			Introduction to Resistors,		
			Capacitors, Inductors and	03	
			Transformers,		
			Concept of ideal dc voltage and		
			current source,	03	15
			KVL, KCL,	02	
			Thevenin's, Norton's,	07	
			maximum power transfer,		
			Millman's theorem (statement,		
			proof, simple numerical		
			application for dc only).		
2	Aug- Sept	Unit II	Measuring Instruments	04	
			Principles of voltmeter, ammeter, ohmmeter, Multirange DC voltmeter,	04	
			ohm per volt rating, loading effect, Multirange DC	03	15
			Ammeter, Series & shunt type ohmmeter, Multimeter (uses & drawback).	04	13
			CRO Block diagram & explanation, CRT		
			construction & working, uses of CRO (measurement of frequency, amplitude& phase.)	04	
3	Sept	Unit III	Semiconductor Diode and Regulated power		
			<b>supply</b> : Operation and characteristics of PN junction diode,		
			Avalanche and Zener breakdown mechanism,	04	
			Half wave and full wave rectifiers (ripple factor, efficiency, PIV ratings),	03	
			C, L and p filters,		15
			Concept of unregulated and regulated power supply,	02	
			Zener diode voltage regulator,	03	
			Three terminal IC regulator.	03	

Class:-B.Sc. IstYear

			Class:-D.Sc. I Teal		
4	Oct	Unit IV	<b>Bipolar Transistors:</b> NPN and PNP transistor (construction and working)		
			CB, CE & CC configuration, leakage currents,	04	
			Input and output characteristics of CE mode,	04	15
			relation between $\alpha$ and $\beta$ Load line and operating point,	02	
			Amplification action of CE amplifier, biasing and	02	
			stability, Self and fixed bias circuit.	04	
	Nov.	Unit V	Switching and Optoelectronic devices:		
5			Construction, working and characteristics of FET, MOSFET, UJT, SCR, relation of FET parameters, Construction, working & characteristics of LDR, LED, photodiode, photovoltaic cell( Solar cell).	08 02 05	15
6	Dec.	Unit VI	Integrated Circuits: Introduction to IC technology, advantages and disadvantages, Classification of ICs, Basic steps in fabrication of monolithic ICs, Fabrication of diode, resistor & transistor. Scale of integration upto V2LSI', Basic concept of Embedded systems.	03 02 02 03 02 03	15

#### Class:-B.Sc. IstYear Semester:- II<sup>nd</sup>

#### Paper:- Digital Electronics(CBCS)

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan-	Unit. I	Binary Arithmetic & Logic gates :		
	Feb		Binary, Octal & Hexadecimal number system and their interconversion,	06	
			Binary arithmetic (addition and subtraction using 1's & 2's compliment),	02	15
			multiplication & division. Binary codes: 8421 BCD, Excess-3 & Gray code. NOT, OR, AND, NAND, NOR gates (definition and truth table). EXNOR & EXOR gates,	05	
			Half adder, full adder, 4 bit binary full adder.	02	
2	Feb-	Unit II	Boolean Algebra & Logic families:		
	Mar		Boolean laws, De-morgans theorem,	03	
			Simplification of Boolean equations using Boolean algebra, Fundamental products & sum terms, K-map (K-map upto 4 variable).	06	15
			Classification of logic families, characteristics (Fan- in, Fanout, Noise immunity, Propogation delay, Power dissipation),	03	
3	<b>M</b>	TT .*4	DTL,TTL & CMOS logic.	03	
3	Mar	Unit III	Multivibrators and Flip Flops: Construction & working of Astable, monostable and Bistable transistorised multivibrators, RS, CK-RS, D, JK, JKMS and T Flip Flops (Logic diagram, Truth table, construction & working),	05	15
			Concept of edge trigger Flip-Flop, Concept of preset	05	
			& clear terminal.	05	
4	Mar-	Unit	Counters and Shift registers:		
	Apr	IV	Asynchronous & synchronous Counter, Up-down counters (up to 4-bits),	03	
			modified asynchronous counter (Mod -7 ,Mod10,and Mod-13). Types of shift registers,	04	15
			SISO, SIPO, PISO & PIPO, IC version of Mod -10 shift registers (Construction & working),	04	
			IC version of shift register – 7495, Application of shift register. Ring counter, Johnson's counter.	04	

#### Class:-B.Sc. IstYear

#### Semester:- II<sup>nd</sup>

			Semester II		
5	Apr- May	Unit V	Combinational logic circuit: Encoder: Binary to BCD, Decimal to BCD, IC 74147, Decoder: 2 to 4 line, BCD to decimal, BCD to 7 segment, IC 7447, Multiplexer: 4X1, 8X1, De multiplexer: 1X4, 1X8, (Definition, construction, operation and application of above)	05 02 02 06	15
6	Apr- May	Unit VI	Semiconductor Memories: Concept of memory, primary and secondary memory, classification of memories, volatile and non volatile memories, memory Hierarchy, semiconductor memory: RAM, ROM, PROM, EPROM, EEPROM, flash memory.	04 02 02	15

## Class:-B.Sc. II nd Year

## Semester:- III<sup>rd</sup> Paper:- Electronics Devices and Circuits

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Aug	Unit. I	Hybrid-parameters & Cascaded		
			amplifiers:		
			Hybrid-parameters, transistor		
			equivalent circuit of CE,CB,		
			Analysis of small signal CE		15
			amplifiers,	06	
			Concept of cascaded amplifier,	03	
			Types of coupling, RC Coupled		
			Amplifier, Single Tuned		
			amplifiers,	06	
2	Aug- Sept	Unit II	Power Amplifier: Classification of power amplifier, Class A, Class B, Class C and Class AB amplifiers, Class A - transformer coupled amplifier, Class-B push-pull amplifier (Construction, working and	05	15
			efficiency of each). Distortion, complementary symmetry Class-B pushpull amplifier.	05 05	
3	Sept	Unit III	Feedback amplifiers and Oscillators: Concept of feedback, feedback theory, positive and negative feedback, advantage of negative feedback, physical idea of feedback, (Block diagram only), concept of oscillator, basic elements of oscillator, Barkhausen Criteria of oscillation, concept of tank circuit. RC oscillator-Phase shift and Wein bridge oscillator, LC oscillator- Colpitts and Hartley oscillator, Crystal oscillator	04 02 02 07	15
4	Oct	Unit IV	Operational amplifier and applications:		
			Difference amplifier(concept, construction and working), block diagram of operational amplifier, characteristics of ideal op amp, concept of virtual ground, parameter of op amp output impedance, Applications: Op amp as inverting and non inverting amplifier, adder, Subtractor, Differentiator and Integrator.	02 03 10	15

	Nov.	Unit V	Advance applications of Op- Amp:		
5			Solution to simultaneous equation, differential		
			equation for harmonic, damped harmonic oscillator, regenerative comparator, logarithmic amplifier,	04 05	15
			Astable, Monostable and Bistable multivibrator and	05	
			its time period (construction and working).	06	
	Nov-	Unit	A/D and D/A converter:		
6	Dec	VI	Need of A/D and D/A converter.	02	
			D/A converter: R-2R ladder type, Weighted resistor,		
			sample and hold circuit,	04	15
			IC ADC, DAC specification.	02	
			A/D converter: Single and Dual slope, counter type, successive approximation type, specification,		
			Numerical based on A/D and D/A Converter	07	

#### Class:-B.Sc. II<sup>nd</sup> Year Semester- IV<sup>th</sup>

#### B.Sc. II <sup>nd</sup> Year Paper:- Communication Electronics and Microprocessor 8085

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Jan-	Unit. I	Modulation and Demodulation:		
1			Need for modulation, AM theory, Power relation,		
	Feb		Theory of FM,	0.2	
			Numerical on AM and AM Systems, frequency	03	
			spectrum of FM.	03	
			Generation of AM and FM. Collector modulator,		15
			diode reactance modulator.		
			Demodulator: diode detector, slope detector.	03	
			<u> </u>	02	
			Transmitter and receiver: Block diagram and working	04	
			of AM and FM transmitter and receiver.	04	
2	Feb-	Unit II	Fiber Optic Communication :		
	Mar		Introduction ,advantages of OFC ,	02	
	Mai		Types of fibers ,internal reflections ,numerical	02	
			aperature.	03	15
			Optical Sources: Semiconductor injection LASER,		
			LED, (power and efficiency chacteristics).	0.4	
			Optical detectors: Photodiode, PIN diode,	04	
			Phototransistor.	03	
			Optical fiber connection: Jointer and coupler, fiber	0.2	
			alignment and joint losses ,connector couplers.	03	
3	Mar	Unit III	•		
	1,141		Pulse Modulation and Digital Communication:		
			Pulse Modulation, Sampling Theorem PAM, PWM		
			,PPM and PCM (Bandwith of PCM ,Quantizing		
			Noise),	08	
			Application of PCM, Multiplexing Principles: TDM		15
			and FDM , Comparison of FDM and TDM .	07	
4	Mar-	Unit IV	Architecture and timings of 8085:	07	
			Evolution of microprocessor, microcomputer (Block		
	Apr		diagram with function of each block),		
			architecture of Intel 8085 microprocessor, function of	03	
			each block of 8085, Functional pin diagram and		
			function of all pins of 8085, instruction format.	07	15
			Instruction cycle, fetch and execute operation,	07	•
			machine cycle and state, timing diagram of MOV and		
			MVI instructions.	05	
			191 v 1 monucuono.		
	Apr-	Unit V	Instruction and programming of 8085:		
5	_	CIIIC V	Addressing mode, classification of instruction set of		
5	May		8085 with examples, concept of stack and stack		
			pointer, PUSH and POP instruction,		
				04	
			Concept of subroutine: CALL and RET instruction,	02	15
			Delay subroutine (using one register and register pair).	02	13
			Programming: Algorithm, Flowchart, Assembly and		
			machine language, assembly language program such		
			as programme for addition, subtraction,		
			multiplication, division, finding maximum and	07	
			minimum numbers etc.		

### Class:-B.Sc. II nd Year

## Semester:- IV Paper: -:- Communication Electronics and Microprocessor 8085

	Month	Unit	Name of Unit & Topics	Required	
No				Lect.	Lect.
6	May	Unit. VI	Interfacing:	0.2	
			Basic interfacing concept,	02	
			memory mapped I/O and I/O		
			mapped I/O Schemes, data		
			transfer schemes.	03	
			8255PPI: block diagram,		15
			function of each block,		
			Functional pin diagram, ,		
			function of each pin, operating		
			modes of 8255PPI, control		
			word format in I/O and BSR	10	
			mode, illustrative example.	10	

#### Class:-B.Sc. III<sup>rd</sup> Year

### Semester-V<sup>th</sup>

#### **Paper:-Measuring Instruments**

No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	<b>Basic Instrumentation:</b>		
1			Block diagram of generalized instrumentation		
			system, Concept of transducers (Primary and		
			secondary, active and passive, analog and digital).	05	
			Resistive transducer potentiometer, Inductive transducer - LVDT, capacitive transducer (by		15
			changing distance),	05	
			measurement of displacement using capacitive	0.5	
			transducer (By changing dielectric).	05	
2	Aug-	Unit II	Measurement of Temperature:		
	Sept		Thermocouple, Thermopile, Thermister,	06	
	1		RTD, Total Radiation Pyrometer,	03	
			IC DS 1621 ,IC LM34 , IC LM35 ,	04	15
			Infrared Pyrometer,	02	
3	Sept	Unit	Timer and PLL: IC 555 timer:		
	1	III	Block diagram and function of each block,		
			application of 555 timer as a stable, bistable and		
			monostable multivibrator (construction, working		
			and expression for time period).	07	
			PLL Block diagram and function of each block,	04	
			concept of capture range, pull in time, lock in range, electrical characteristics, applications of PLL as FM		15
			demodulator, AM detector and frequency		
			synthesizer	04	
4	Oct	Unit IV	Display, digital Instrument		
			and ecorder:		
			Seven segment, 14 segment, dot		
			matrix, 16x2 LCD display,		
			advantage and disadvantage,	03	
			advantage and disadvantage, Digital instrument: Digital	03	
				03	
			Digital instrument: Digital	03	15
			Digital instrument: Digital frequency meter, Digital	03	15
			Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital	03	15
			Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block		15
			Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each	03	15
			Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block).  Recorder: Classification,		15
			Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block).  Recorder: Classification, necessity of recorder, XY		15
			Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block).  Recorder: Classification,	07	15
	Nov.	Unit V	Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block). Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.		15
5	Nov.	Unit V	Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block). Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.  Sensors and Actuators:	07	15
5	Nov.	Unit V	Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block). Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.	07	15
5	Nov.	Unit V	Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block). Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.  Sensors and Actuators: Sensors: Definition, Methods of fabrication of	07	
5	Nov.	Unit V	Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block). Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.  Sensors and Actuators: Sensors: Definition, Methods of fabrication of Sensors, Types of sensors (Mechanical, Thermal,	07	15

6	Nov.	Unit VI	Biomedical electronics: Introduction, Type of electrode, EEG, EMG, ECG-block diagram and function of each block,	06	
			X ray machine, instantaneous heart rate meter- systolic and diastolic blood pressure meter, EAR oximeter, pulse Oximeter, range gated pulse	03	15
			Doppler blood flow meter, Laser Doppler blood flow meter.	07	

#### Class:-B.Sc. III<sup>rd</sup> Year Semester-VI<sup>th</sup>

Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan- Feb	Unit. I	8086 Architecture: Block diagram of 8086 microprocessor, BIU and EU, operating modes of 8086, register of 8086-G.P.R, pointer and index register, segment register, concept of segmented memory, instruction pointer, status flag, pin diagram of 8086 microprocessor, physical and effective address.	07 08	15
2	Feb- Mar	Unit II	Instructions and programming of 8086 Instructions: MOV, PUSH, POP, LEA, LDS, LES, Arithmetic & Logic Instructions. Addressing mode, 8086 instruction, Bus cycle, Programming: programs of data transfer, addition, subtraction, division, multiplication using various	04 03	15
3	Mar	Unit III	addressing mode.  8051 Microcontroller Architecture:  Microcontroller Introduction, Difference between  Microprocessor and Microcontroller,  block diagram of microcontroller, CPU, registers, flags,  PSW, PC, Data Pointer, SFR, SP,  Internal RAM/ROM, External memory, I/O ports, counter	08 05 05 05	15
4	Mar- Apr	Unit IV	& timers, interrupts.  Instruction set of 8051 and Programming:  Addressing mode, Instruction set: Data transfer, arithmetic, logical operation, JUMP, Loop and CALL instructions.  Assembly language programming examples: simple data transfer, arithmetic, logical and single bit.	08	15
5	Apr- May	Unit V	8051 Interfacing & Application: Basics of serial communication, interfacing with RS-232C, SCON and PCON registers, interfacing a DAC / ADC and waveform generation, interfacing to the 8255, interfacing LED, power reduction mode.	05 05 05	15

#### Class:-B.Sc. III<sup>rd</sup> Year

# Semester-VI<sup>th</sup> Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
6	May	Unit. VI	Advance microcontroller: Introduction to AVR, Arithmetic and logic Unit, program and data memories, downloadable flash program memory, SRAM data memory, general purpose register file, I/O register, EEPROM data memory, peripherals, Timers/ Counters.	04 02 05 04	15

Amrut Sevabhavi Sanstha, Parbhani.

#### Late Ku. Durga K. Banmeru Science College, Lonar Dist-Buldhana.

# Department of Electronics

**Teaching Plan 2019-20** 

#### Class:-B.Sc. IstYear Semester:- Ist

#### **Paper:- Basic Of Electronics(CBCS)**

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Passive component and		
1			Network Theorems		
			Introduction to Resistors,		
			Capacitors, Inductors and	04	
			Transformers,		
			Concept of ideal dc voltage and		
			current source,	02	15
			KVL, KCL,	02	
			Thevenin's, Norton's,	07	
			maximum power transfer,		
			Millman's theorem (statement,		
			proof, simple numerical		
			application for dc only).		
2	Aug-	Unit II	<b>Measuring Instruments</b>		
	Sept		Principles of voltmeter, ammeter, ohmmeter,	03	
			Multirange DC voltmeter, ohm per volt rating, loading effect, Multirange DC	03	
			Ammeter, Series & shunt type ohmmeter,	04	15
			Multimeter (uses & drawback). CRO Block diagram & explanation, CRT		
			construction & working, uses of CRO	05	
			(measurement of frequency, amplitude& phase.)		
3	Sept	Unit III	Semiconductor Diode and Regulated power supply:		
			Operation and characteristics of PN junction diode,		
			Avalanche and Zener breakdown mechanism, Half wave and full wave rectifiers (ripple factor,	04	
			efficiency, PIV ratings),	03	
			C, L and p filters, Concept of unregulated and regulated power	02	15
			supply,	03	
			Zener diode voltage regulator, Three terminal IC regulator.	02	
			1 toliminal to logalatol.	03	

#### Class:-B.Sc. IstYear Oct **Unit IV Bipolar Transistors:** NPN and PNP transistor (construction and working) 05 CB, CE & CC configuration, leakage currents, Input and output characteristics of CE mode, 03 15 relation between $\alpha$ and $\beta$ Load line and operating 02 point, Amplification action of CE amplifier, biasing and 02 stability, Self and fixed bias circuit. 04 Unit V **Switching and Optoelectronic devices**: Nov. Construction, working and characteristics of FET, 5 MOSFET, UJT, SCR, relation of FET parameters, 07 Construction, working & characteristics of LDR, 15 03 LED, photodiode, photovoltaic cell( Solar cell). 05 **Unit VI Integrated Circuits:** Dec. Introduction to IC technology, advantages and disadvantages, 03 Classification of ICs, 02 Basic steps in fabrication of monolithic ICs, 15 02 Fabrication of diode, resistor & transistor. 03 Scale of integration upto V2LSI', 02 Basic concept of Embedded systems. 03

#### Class:-B.Sc. IstYear Semester:- II<sup>nd</sup>

#### Paper:- Digital Electronics(CBCS)

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan-	Unit. I	Binary Arithmetic & Logic gates :		
	Feb		Binary, Octal & Hexadecimal number system and their interconversion,	07	
			Binary arithmetic (addition and subtraction using 1's & 2's compliment),	01	15
			multiplication & division. Binary codes: 8421 BCD, Excess-3 & Gray code. NOT, OR, AND, NAND, NOR gates (definition and truth table). EXNOR & EXOR gates,	05	
			Half adder, full adder, 4 bit binary full adder.	02	
2	Feb-	Unit II	Boolean Algebra & Logic families:		
	Mar		Boolean laws, De-morgans theorem,	03	
			Simplification of Boolean equations using Boolean algebra, Fundamental products & sum terms, K-map (K-map upto 4 variable).	06	15
			Classification of logic families, characteristics (Fan- in, Fanout, Noise immunity, Propogation delay, Power dissipation),	03	
	3.4	TT *4	DTL,TTL & CMOS logic.	03	
3	Mar	Unit III	Multivibrators and Flip Flops: Construction & working of Astable, monostable and Bistable transistorised multivibrators, RS, CK-RS, D, JK, JKMS and T Flip Flops (Logic diagram, Truth table, construction & working),	05	15
			Concept of edge trigger Flip-Flop, Concept of preset	05	
			& clear terminal.	05	
4	Mar-	Unit	Counters and Shift registers:		
	Apr	IV	Asynchronous & synchronous Counter, Up-down counters (up to 4-bits),	03	
			modified asynchronous counter (Mod -7 ,Mod10,and Mod-13). Types of shift registers,	04	15
			SISO, SIPO, PISO & PIPO, IC version of Mod -10 shift registers (Construction & working),	04	
			IC version of shift register – 7495, Application of shift register. Ring counter, Johnson's counter.	04	

#### Class:-B.Sc. IstYear

#### Semester:- II<sup>nd</sup>

			Semester :- 11		
5	Apr- May	Unit V	Combinational logic circuit: Encoder: Binary to BCD, Decimal to BCD, IC 74147, Decoder: 2 to 4 line, BCD to decimal, BCD to 7 segment, IC 7447, Multiplexer: 4X1, 8X1, De multiplexer: 1X4, 1X8, (Definition, construction, operation and application of above)	05 03 02 05	15
6	Apr- May	Unit VI	Semiconductor Memories: Concept of memory, primary and secondary memory, classification of memories, volatile and non volatile memories, memory Hierarchy, semiconductor memory: RAM, ROM, PROM, EPROM, EEPROM, flash memory.	04 02 02	15

## Class:-B.Sc. II nd Year

## Semester:- III<sup>rd</sup> Paper:- Electronics Devices and Circuits

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Hybrid-parameters & Cascaded		
1			amplifiers:		
			Hybrid-parameters, transistor		
			equivalent circuit of CE,CB,		
			Analysis of small signal CE		15
			amplifiers,	07	10
			Concept of cascaded amplifier,	02	
			Types of coupling, RC Coupled	02	
			Amplifier, Single Tuned		
			amplifiers,	06	
2	Aug-	Unit II	Power Amplifier:		
	Sept		Classification of power amplifier, Class A, Class B, Class C and Class AB amplifiers, Class A - transformer coupled amplifier, Class-B	05	
			push-pull amplifier (Construction, working and efficiency of each).	05	15
			Distortion, complementary symmetry Class-B push- pull amplifier.	05	
3	Sept	Unit III	Feedback amplifiers and Oscillators:		
3	Бері		Concept of feedback, feedback theory, positive and	03	
			negative feedback,	0.5	15
			advantage of negative feedback, physical idea of feedback, (Block diagram only),	02	13
			concept of oscillator, basic elements of oscillator,	03 03	
			Barkhausen Criteria of oscillation, concept of tank circuit. RC oscillator-Phase shift and Wein bridge		
			oscillator, LC oscillator- Colpitts and Hartley	06	
	0-4	Unit IV	oscillator, Crystal oscillator	00	
4	Oct	Unit IV	<b>Operational amplifier and applications:</b> Difference amplifier(concept, construction and		
			working),	01	
			block diagram of operational amplifier, characteristics of ideal op amp, concept of virtual	03	
			ground, parameter of op amp output impedance,		15
			Applications: Op amp as inverting and non inverting amplifier, adder, Subtractor, Differentiator and Integrator.	11	

	Nov.	Unit V	Advance applications of Op- Amp:		
5			Solution to simultaneous equation, differential		
			equation for harmonic, damped harmonic oscillator, regenerative	04	1.5
			comparator, logarithmic amplifier,	04	15
			Astable, Monostable and Bistable multivibrator and		
			its time period (construction and working).	07	
	Nov-	Unit	A/D and D/A converter:		
6	Dec	VI	Need of A/D and D/A converter.	02	
			D/A converter: R-2R ladder type, Weighted resistor,		
			sample and hold circuit,	03	15
			IC ADC, DAC specification.	03	
			A/D converter: Single and Dual slope, counter type, successive approximation type, specification,		
			Numerical based on A/D and D/A Converter	07	

#### Class:-B.Sc. II<sup>nd</sup> Year Semester- IV<sup>th</sup>

#### B.Sc. II <sup>nd</sup> Year Paper:- Communication Electronics and Microprocessor 8085

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Jan-	Unit. I	Modulation and Demodulation:		
1			Need for modulation, AM theory, Power relation,		
	Feb		Theory of FM,		
			Numerical on AM and AM Systems, frequency	03	
			spectrum of FM.	03	
			1	03	15
			Generation of AM and FM . Collector modulator,		13
			diode reactance modulator.	03	
			Demodulator: diode detector, slope detector.	02	
			Transmitter and receiver :Block diagram and working		
			of AM and FM transmitter and receiver.	04	
2	Feb-	Unit II	Fiber Optic Communication :		
	3.4		Introduction ,advantages of OFC ,	02	
	Mar		Types of fibers ,internal reflections ,numerical	02	
			aperature.	03	15
			Optical Sources: Semiconductor injection LASER,		
			LED ,(power and efficiency chacteristics).		
			Optical detectors : Photodiode , PIN diode ,	04	
			Phototransistor.	03	
			Optical fiber connection: Jointer and coupler, fiber	03	
			<u> </u>	03	
3	Man	Unit III	alignment and joint losses ,connector couplers.		
3	Mar	Unit III	Pulse Modulation and Digital Communication:		
			Pulse Modulation, Sampling Theorem PAM, PWM		
			,PPM and PCM (Bandwith of PCM ,Quantizing		
			Noise),	08	
			Application of PCM, Multiplexing Principles: TDM	00	15
			and FDM, Comparison of FDM and TDM.		13
			and I Divi , Comparison of I Divi and I Divi .	07	
4	Mar-	Unit IV	Architecture and timings of 8085:		
-		C 1110 1 V	Evolution of microprocessor, microcomputer (Block		
	Apr		diagram with function of each block),		
			architecture of Intel 8085 microprocessor, function of	04	
			each block of 8085, Functional pin diagram and	06	15
			function of all pins of 8085, instruction format.	06	13
			Instruction cycle, fetch and execute operation,		
			machine cycle and state, timing diagram of MOV and	05	
			MVI instructions.		
		<b>**</b> ** *==			
_	Apr-	Unit V	Instruction and programming of 8085:		
5	May		Addressing mode, classification of instruction set of		
	1.143		8085 with examples, concept of stack and stack		
			pointer, PUSH and POP instruction,	04	
			Concept of subroutine: CALL and RET instruction,		
			Delay subroutine (using one register and register pair).	02	15
			Programming: Algorithm, Flowchart, Assembly and	02	
			machine language, assembly language program such		
			machine language, assembly language program such as programme for addition, subtraction.		
			machine language, assembly language program such as programme for addition, subtraction, multiplication, division, finding maximum and	07	

#### Class:-B.Sc. II nd Year

## Semester:- IV Paper: -:- Communication Electronics and Microprocessor 8085

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	May	Unit. VI	Interfacing: Basic interfacing concept,	03	
			memory mapped I/O and I/O		
			mapped I/O Schemes, data transfer schemes.	03	
			8255PPI: block diagram,	03	15
			function of each block, Functional pin diagram,,		
			function of each pin, operating modes of 8255PPI, control		
			word format in I/O and BSR mode, illustrative example.	09	

#### Class:-B.Sc. III<sup>rd</sup> Year

### Semester-V<sup>th</sup>

#### **Paper:-Measuring Instruments**

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Basic Instrumentation:		
1			Block diagram of generalized instrumentation		
			system, Concept of transducers (Primary and	0.7	
			secondary, active and passive, analog and digital). Resistive transducer potentiometer, Inductive	05	
			transducer - LVDT, capacitive transducer (by		15
			changing distance),	05	
			measurement of displacement using capacitive		
			transducer (By changing dielectric).	05	
2	Aug-	Unit II	Measurement of Temperature:		
	Sept		Thermocouple, Thermopile, Thermister,	06	
			RTD, Total Radiation Pyrometer,	03	1.5
			IC DS 1621 ,IC LM34 , IC LM35 ,	04	15
			Infrared Pyrometer,	02	
3	Sept	Unit	Timer and PLL: IC 555 timer:		
		III	Block diagram and function of each block,		
			application of 555 timer as a stable, bistable and		
			monostable multivibrator (construction, working and expression for time period).		
			PLL Block diagram and function of each block,	07	
			concept of capture range, pull in time, lock in range,	04	
			electrical characteristics, applications of PLL as FM		15
			demodulator, AM detector and frequency		
			synthesizer	04	
4	Oct	Unit IV	Display, digital Instrument		
			and ecorder:		
			Seven segment, 14 segment, dot		
			matrix, 16x2 LCD display,		
			advantage and disadvantage,	03	
			Digital instrument: Digital		
			frequency meter, Digital		
			voltmeter (Ramp type), Digital		15
			capacitance meter (Block		
			diagram and function of each		
			block).	07	
			Recorder: Classification,		
			necessity of recorder, XY		
			recorder, magnetic tape		
			recorder.	05	
	Nov.	Unit V	Sensors and Actuators:		
5	Nov.	Unit V	Sensors and Actuators: Sensors: Definition, Methods of fabrication of	08	
5	Nov.	Unit V	Sensors: Definition, Methods of fabrication of Sensors, Types of sensors (Mechanical, Thermal,	08	
5	Nov.	Unit V	Sensors: Definition, Methods of fabrication of Sensors, Types of sensors (Mechanical, Thermal, Optical, magnetic, chemical)	08	15
5	Nov.	Unit V	Sensors: Definition, Methods of fabrication of Sensors, Types of sensors (Mechanical, Thermal,	08	15

	Nov.	Unit VI	Biomedical electronics:		
6			Introduction, Type of electrode, EEG, EMG, ECG-block diagram and function of each block, X ray machine, instantaneous heart rate meter-	06	
			systolic and diastolic blood pressure meter, EAR oximeter, pulse Oximeter, range gated pulse Doppler blood flow meter, Laser Doppler blood flow	03	15
			meter.	07	

### Class:-B.Sc. III<sup>rd</sup> Year Semester-VI<sup>th</sup>

Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan- Feb	Unit. I	8086 Architecture: Block diagram of 8086 microprocessor, BIU and EU, operating modes of 8086, register of 8086-G.P.R, pointer and index register, segment register, concept of segmented memory, instruction pointer, status flag, pin diagram of 8086 microprocessor, physical and effective address.	07 08	15
2	Feb- Mar	Unit II	Instructions and programming of 8086 Instructions: MOV, PUSH, POP, LEA, LDS, LES, Arithmetic & Logic Instructions. Addressing mode, 8086 instruction, Bus cycle, Programming: programs of data transfer, addition,	04 04	15
3	Mar	Unit III	subtraction, division, multiplication using various addressing mode.  8051 Microcontroller Architecture:  Microcontroller Introduction, Difference between	07	
			Microcontroller introduction, Difference between Microprocessor and Microcontroller, block diagram of microcontroller, CPU, registers, flags, PSW, PC, Data Pointer, SFR, SP, Internal RAM/ROM, External memory, I/O ports, counter & timers, interrupts.	05 05 05	15
4	Mar- Apr	Unit IV	Instruction set of 8051 and Programming:		
	Αрι		Addressing mode, Instruction set: Data transfer, arithmetic, logical operation, JUMP, Loop and CALL instructions.  Assembly language programming examples:	07	15
			simple data transfer, arithmetic, logical and single bit.	08	
5	Apr- May	Unit V	8051 Interfacing & Application: Basics of serial communication, interfacing with RS-232C, SCON and PCON registers, interfacing a DAC / ADC and waveform generation, interfacing to the 8255, interfacing LED, power reduction mode.	05 05 05	15

### Class:-B.Sc. III<sup>rd</sup> Year

# Semester-VI<sup>th</sup> Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
6	May	Unit. VI	Advance microcontroller: Introduction to AVR, Arithmetic and logic Unit, program and data memories, downloadable flash program memory, SRAM data memory, general purpose register file, I/O register, EEPROM data memory, peripherals, Timers/ Counters.	04 02 04 05	15

Amrut Sevabhavi Sanstha, Parbhani.

### Late Ku. Durga K. Banmeru Science College, Lonar Dist-Buldhana.

# Department of Electronics

**Teaching Plan 2020-21** 

### Class:-B.Sc. IstYear Semester:- Ist

### Paper:- Basic Of Electronics(CBCS)

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Passive component and		
1			Network Theorems		
			Introduction to Resistors,		
			Capacitors, Inductors and	04	
			Transformers,		
			Concept of ideal dc voltage and	02	1.5
			current source,	02	15
			KVL, KCL,	02	
			Thevenin's, Norton's,	07	
			maximum power transfer,		
			Millman's theorem (statement,		
			proof, simple numerical		
			application for dc only).		
2	Aug-	Unit II			
_	Sept		Measuring Instruments  Principles of voltmeter, ammeter, ohmmeter,	03	
			Multirange DC voltmeter,		
			ohm per volt rating, loading effect, Multirange DC Ammeter, Series & shunt type ohmmeter,	04	15
			Multimeter (uses & drawback).	04	
			CRO Block diagram & explanation, CRT construction & working, uses of CRO		
			(measurement of frequency, amplitude& phase.)	04	
3	Sept	Unit III			
			<b>supply</b> : Operation and characteristics of PN junction diode,		
			Avalanche and Zener breakdown mechanism,	04	
			Half wave and full wave rectifiers (ripple factor, efficiency, PIV ratings),	03	
			C, L and p filters,		15
			Concept of unregulated and regulated power supply,	03	
			Zener diode voltage regulator,	02	
			Three terminal IC regulator.	03	

### Class:-B.Sc. IstYear **Bipolar Transistors:** Oct **Unit IV** NPN and PNP transistor (construction and working) 03 CB, CE & CC configuration, leakage currents, Input and output characteristics of CE mode, 03 15 relation between $\alpha$ and $\beta$ Load line and operating 02 point, Amplification action of CE amplifier, biasing and 02 stability, Self and fixed bias circuit. 05 Nov. Unit V **Switching and Optoelectronic devices**: Construction, working and characteristics of FET, 5 MOSFET, UJT, SCR, relation of FET parameters, 08 Construction, working & characteristics of LDR, 15 02 LED, photodiode, photovoltaic cell( Solar cell). 05 Dec. **Unit VI Integrated Circuits:** Introduction to IC technology, advantages and disadvantages, 02 Classification of ICs, 02 Basic steps in fabrication of monolithic ICs, 03 15 Fabrication of diode, resistor & transistor. 03 Scale of integration upto V2LSI', 02 Basic concept of Embedded systems. 03

### Class:-B.Sc. IstYear Semester:- IInd

### Paper:- Digital Electronics(CBCS)

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan-	Unit. I	Binary Arithmetic & Logic gates :		
	Feb		Binary, Octal & Hexadecimal number system and their interconversion,	07	
			Binary arithmetic (addition and subtraction using 1's & 2's compliment),	01	15
			multiplication & division. Binary codes: 8421 BCD, Excess-3 & Gray code. NOT, OR, AND, NAND, NOR gates (definition and truth table). EXNOR & EXOR gates, Half adder, full adder, 4 bit binary full adder.	05 02	
2	Feb-	Unit II	Boolean Algebra & Logic families:		
	Mar		Boolean laws, De-morgans theorem,	02	
			Simplification of Boolean equations using Boolean algebra, Fundamental products & sum terms, K-map (K-map upto 4 variable).	07	15
			Classification of logic families, characteristics (Fan- in, Fanout, Noise immunity, Propogation delay, Power dissipation),	03	
3	Mar	Unit	DTL,TTL & CMOS logic.  Multivibrators and Flip Flops:	03	
3		III	Construction & working of Astable, monostable and Bistable transistorised multivibrators, RS, CK-RS, D, JK, JKMS and T Flip Flops (Logic diagram, Truth table, construction & working),	05	15
			Concept of edge trigger Flip-Flop, Concept of preset	05	
			& clear terminal.	05	
4	Mar-	Unit	Counters and Shift registers:		
	Apr	IV	Asynchronous & synchronous Counter, Up-down counters (up to 4-bits),	04	
			modified asynchronous counter (Mod -7, Mod10, and Mod-13). Types of shift registers,	04	15
			SISO, SIPO, PISO & PIPO, IC version of Mod -10 shift registers (Construction & working),	03	
			IC version of shift register – 7495, Application of shift register. Ring counter, Johnson's counter.	04	

## Class:-B.Sc. IstYear

### Semester:- II<sup>nd</sup>

			Semester II		
5	Apr- May	Unit V	Combinational logic circuit: Encoder: Binary to BCD, Decimal to BCD, IC 74147, Decoder: 2 to 4 line, BCD to decimal, BCD to 7 segment, IC 7447, Multiplexer: 4X1, 8X1, De multiplexer: 1X4, 1X8, (Definition, construction, operation and application of above)	05 02 03 05	15
6	Apr- May	Unit VI	Semiconductor Memories: Concept of memory, primary and secondary memory, classification of memories, volatile and non volatile memories, memory Hierarchy, semiconductor memory: RAM, ROM, PROM, EPROM, EEPROM, flash memory.	04 02 09	15

### Class:-B.Sc. II <sup>nd</sup> Year Semester:- III<sup>rd</sup>

### **Paper:- Electronics Devices and Circuits**

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Hybrid-parameters & Cascaded		
1			amplifiers:		
			Hybrid-parameters, transistor		
			equivalent circuit of CE,CB,		
			Analysis of small signal CE		15
			amplifiers,	07	10
			Concept of cascaded amplifier,	02	
			Types of coupling, RC Coupled		
			Amplifier, Single Tuned		
			amplifiers,	06	
2	Aug-	Unit II	Power Amplifier:		
	Sept		Classification of power amplifier, Class A, Class B, Class C and Class AB amplifiers, Class A - transformer coupled amplifier, Class-B	05	
			push-pull amplifier (Construction, working and efficiency of each).	05	15
			Distortion, complementary symmetry Class-B push- pull amplifier.	05	
3	Cont	Unit III	Foodback amplifions and Oscillators		
3	Sept		<b>Feedback amplifiers and Oscillators:</b> Concept of feedback, feedback theory, positive and	03	
			negative feedback,	0.5	15
			advantage of negative feedback, physical idea of feedback, (Block diagram only),	02	13
			concept of oscillator, basic elements of oscillator,	03 02	
			Barkhausen Criteria of oscillation, concept of tank circuit. RC oscillator-Phase shift and Wein bridge		
			oscillator, LC oscillator- Colpitts and Hartley	07	
4	Oct	Unit IV	oscillator, Crystal oscillator  Operational amplifier and applications:	07	
7	Oct	Cint I v	Difference amplifier(concept, construction and		
			working),	01	
			block diagram of operational amplifier, characteristics of ideal op amp, concept of virtual	03	
			ground, parameter of op amp output impedance,		15
			Applications: Op amp as inverting and non inverting amplifier, adder, Subtractor, Differentiator and Integrator.	1 1	

Nov.	Unit V	Advance applications of Op- Amp:		
		Solution to simultaneous equation, differential		
		equation for harmonic,	04	
		comparator, logarithmic amplifier,	04	15
		Astable, Monostable and Bistable multivibrator and		
		its time period (construction and working).	07	
Nov-	Unit	A/D and D/A converter:		
Dec	VI	Need of A/D and D/A converter.	03	
		D/A converter: R-2R ladder type, Weighted resistor,		
		sample and hold circuit,	03	15
		IC ADC, DAC specification.	02	
		A/D converter: Single and Dual slope, counter type, successive approximation type, specification,		
		Numerical based on A/D and D/A Converter	07	
	Nov-		Solution to simultaneous equation, differential equation for harmonic, damped harmonic oscillator, regenerative comparator, logarithmic amplifier, Astable, Monostable and Bistable multivibrator and its time period (construction and working).  Nov- Dec VI A/D and D/A converter: Need of A/D and D/A converter. D/A converter: R-2R ladder type, Weighted resistor, sample and hold circuit, IC ADC, DAC specification. A/D converter: Single and Dual slope, counter type, successive approximation type, specification,	Solution to simultaneous equation, differential equation for harmonic, damped harmonic oscillator, regenerative comparator, logarithmic amplifier, Astable, Monostable and Bistable multivibrator and its time period (construction and working).  Nov- Unit Dec VI Need of A/D and D/A converter: Need of A/D and D/A converter.  D/A converter: R-2R ladder type, Weighted resistor, sample and hold circuit, sample and hold circuit, IC ADC, DAC specification. A/D converter: Single and Dual slope, counter type, successive approximation type, specification,  Nemerical based on A/D and D/A Converter.

### Class:-B.Sc. II<sup>nd</sup> Year Semester- IV<sup>th</sup>

### B.Sc. II <sup>nd</sup> Year Paper:- Communication Electronics and Microprocessor 8085

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan-	Unit. I	Modulation and Demodulation: Need for modulation, AM theory, Power relation,		
	Feb		Theory of FM,	03	
			Numerical on AM and AM Systems, frequency		
			spectrum of FM. Generation of AM and FM. Collector modulator,	03	15
			diode reactance modulator.	02	
			Demodulator: diode detector, slope detector.	03 02	
			Transmitter and receiver :Block diagram and working		
			of AM and FM transmitter and receiver.	04	
2	Feb-	Unit II	Fiber Optic Communication :		
	Mar		Introduction ,advantages of OFC , Types of fibers ,internal reflections ,numerical	02	
			aperature.	03	15
			Optical Sources: Semiconductor injection LASER,		
			LED ,(power and efficiency chacteristics).	04	
			Optical detectors : Photodiode , PIN diode ,		
			Phototransistor . Optical fiber connection : Jointer and coupler ,fiber	03	
			alignment and joint losses ,connector couplers.	03	
3	Mar	Unit III	Pulse Modulation and Digital Communication:		
			Pulse Modulation, Sampling Theorem PAM, PWM		
			,PPM and PCM (Bandwith of PCM ,Quantizing Noise ) ,	08	
			Application of PCM, Multiplexing Principles: TDM		15
			and FDM, Comparison of FDM and TDM.	07	
4	Mar-	Unit IV	Architecture and timings of 8085:		
	Apr		Evolution of microprocessor, microcomputer (Block		
	-		diagram with function of each block), architecture of Intel 8085 microprocessor, function of	03	
			each block of 8085, Functional pin diagram and		
			function of all pins of 8085, instruction format.	07	15
			Instruction cycle, fetch and execute operation,		
			machine cycle and state, timing diagram of MOV and MVI instructions.	05	
ے	Apr-	Unit V	Instruction and programming of 8085:		
5	May		Addressing mode, classification of instruction set of 8085 with examples, concept of stack and stack		
			pointer, PUSH and POP instruction,	0.4	
			Concept of subroutine: CALL and RET instruction,	04	
			Delay subroutine (using one register and register pair).	02 02	15
			Programming: Algorithm, Flowchart, Assembly and	02	
			machine language, assembly language program such as programme for addition, subtraction,		
			multiplication, division, finding maximum and	07	
			minimum numbers etc.		

## Class:-B.Sc. II nd Year

## Semester:- IV Paper: -:- Communication Electronics and Microprocessor 8085

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	May	Unit.		Lect.	Lect.
6	1.1.1	VI	Interfacing:	03	
			Basic interfacing concept,	03	
			memory mapped I/O and I/O		
			mapped I/O Schemes, data	02	
			transfer schemes.		
			8255PPI: block diagram,	02	15
			function of each block,		
			Functional pin diagram, ,		
			function of each pin, operating		
			modes of 8255PPI, control		
			word format in I/O and BSR	10	
			mode, illustrative example.		

## Class:-B.Sc. III<sup>rd</sup> Year

### Semester-V<sup>th</sup>

### **Paper:-Measuring Instruments**

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Basic Instrumentation:		
1	1145		Block diagram of generalized instrumentation system, Concept of transducers (Primary and secondary, active and passive, analog and digital). Resistive transducer potentiometer, Inductive transducer - LVDT, capacitive transducer (by changing distance), measurement of displacement using capacitive transducer (By changing dielectric).	05 05 05	15
2	Aug-	Unit II	Measurement of Temperature:		
	Sept		Thermocouple, Thermopile, Thermister,	06	
	~ · · ·		RTD, Total Radiation Pyrometer,	03	
			IC DS 1621 ,IC LM34 , IC LM35 ,	04	15
			Infrared Pyrometer,	02	
3	Sept	Unit	Timer and PLL: IC 555 timer:	02	
	Sept	III	Block diagram and function of each block, application of 555 timer as astable, bistable and monostable multivibrator (construction, working and expression for time period).  PLL Block diagram and function of each block, concept of capture range, pull in time, lock in range, electrical characteristics, applications of PLL as FM demodulator, AM detector and frequency	07 04	15
			synthesizer	04	
4	Oct	Unit IV	Display, digital Instrument and ecorder: Seven segment, 14 segment, dot matrix, 16x2 LCD display, advantage and disadvantage, Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block). Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.	04 06	15
	Nov.	Unit V	Sensors and Actuators:		
5			Sensors: Definition, Methods of fabrication of Sensors, Types of sensors (Mechanical, Thermal, Optical, magnetic, chemical) Actuators: Definition, Working principles of Electromechanical, Electro thermal, Electro-optical	08	15

	Nov.	Unit VI	Biomedical electronics:		
6			Introduction, Type of electrode, EEG, EMG, ECG- block diagram and function of each block, X ray machine, instantaneous heart rate meter-	06	
			systolic and diastolic blood pressure meter, EAR oximeter, pulse Oximeter, range gated pulse Doppler blood flow meter, Laser Doppler blood flow	03	15
			meter.	07	

### Class:-B.Sc. III<sup>rd</sup> Year Semester-VI<sup>th</sup>

Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan- Feb	Unit. I	8086 Architecture: Block diagram of 8086 microprocessor, BIU and EU, operating modes of 8086, register of 8086-G.P.R, pointer and index register, segment register, concept of segmented memory, instruction pointer, status flag, pin diagram of 8086 microprocessor, physical and effective address.	07 08	15
2	Feb- Mar	Unit II	Instructions and programming of 8086 Instructions: MOV, PUSH, POP, LEA, LDS, LES, Arithmetic & Logic Instructions. Addressing mode, 8086 instruction, Bus cycle, Programming: programs of data transfer, addition, subtraction, division, multiplication using various addressing mode.	03 04 08	15
3	Mar	Unit III	•	05 05 05	15
4	Mar- Apr	Unit IV	Instruction set of 8051 and Programming:  Addressing mode, Instruction set: Data transfer, arithmetic, logical operation, JUMP, Loop and CALL instructions.  Assembly language programming examples: simple data transfer, arithmetic, logical and single bit.	08	15
5	Apr- May	Unit V	8051 Interfacing & Application: Basics of serial communication, interfacing with RS-232C, SCON and PCON registers, interfacing a DAC / ADC and waveform generation, interfacing to the 8255, interfacing LED, power reduction mode.	05 05 05	15

## Class:-B.Sc. III<sup>rd</sup> Year

# Semester-VI<sup>th</sup> Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
6	May	Unit. VI	Advance microcontroller: Introduction to AVR, Arithmetic and logic Unit, program and data memories, downloadable flash program memory, SRAM data memory, general purpose register file, I/O register, EEPROM data memory, peripherals, Timers/ Counters.	04 02 05 04	15

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# Department of Electronics

**Teaching Plan 2021-22** 

### Class:-B.Sc. IstYear Semester:- Ist

### Paper:- Basic Of Electronics(CBCS)

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Passive component and		
1			Network Theorems		
			Introduction to Resistors,		
			Capacitors, Inductors and	04	
			Transformers,		
			Concept of ideal dc voltage and	02	1.5
			current source,	02	15
			KVL, KCL,	02	
			Thevenin's, Norton's,	07	
			maximum power transfer,		
			Millman's theorem (statement,		
			proof, simple numerical		
			application for dc only).		
2	Aug-	Unit II			
_	Sept		Measuring Instruments  Principles of voltmeter, ammeter, ohmmeter,	03	
			Multirange DC voltmeter,		
			ohm per volt rating, loading effect, Multirange DC Ammeter, Series & shunt type ohmmeter,	04	15
			Multimeter (uses & drawback).	04	
			CRO Block diagram & explanation, CRT construction & working, uses of CRO		
			(measurement of frequency, amplitude& phase.)	04	
3	Sept	Unit III			
			<b>supply</b> : Operation and characteristics of PN junction diode,		
			Avalanche and Zener breakdown mechanism,	04	
			Half wave and full wave rectifiers (ripple factor, efficiency, PIV ratings),	03	
			C, L and p filters,		15
			Concept of unregulated and regulated power supply,	03	
			Zener diode voltage regulator,	02	
			Three terminal IC regulator.	03	

### Class:-B.Sc. IstYear **Bipolar Transistors:** Oct **Unit IV** NPN and PNP transistor (construction and working) 05 CB, CE & CC configuration, leakage currents, Input and output characteristics of CE mode, 03 15 relation between $\alpha$ and $\beta$ Load line and operating 02 point, Amplification action of CE amplifier, biasing and 02 stability, Self and fixed bias circuit. 04 Nov. Unit V **Switching and Optoelectronic devices**: Construction, working and characteristics of FET, 5 MOSFET, UJT, SCR, relation of FET parameters, 08 Construction, working & characteristics of LDR, 15 02 LED, photodiode, photovoltaic cell( Solar cell). 05 Dec. **Unit VI Integrated Circuits:** Introduction to IC technology, advantages and disadvantages, 03 Classification of ICs, 02 Basic steps in fabrication of monolithic ICs, 02 15 Fabrication of diode, resistor & transistor. 03 Scale of integration upto V2LSI', 02 Basic concept of Embedded systems. 03

### Class:-B.Sc. IstYear Semester:- IInd

### Paper:- Digital Electronics(CBCS)

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan-	Unit. I	Binary Arithmetic & Logic gates :		
	Feb		Binary, Octal & Hexadecimal number system and their interconversion,	07	
			Binary arithmetic (addition and subtraction using 1's & 2's compliment),	01	15
			multiplication & division. Binary codes: 8421 BCD, Excess-3 & Gray code. NOT, OR, AND, NAND, NOR gates (definition and truth table). EXNOR & EXOR gates,	05	
			Half adder, full adder, 4 bit binary full adder.	02	
2	Feb-	Unit II	Boolean Algebra & Logic families:		
	Mar		Boolean laws, De-morgans theorem,	02	
			Simplification of Boolean equations using Boolean algebra, Fundamental products & sum terms, K-map (K-map upto 4 variable).	07	15
			Classification of logic families, characteristics (Fan- in, Fanout, Noise immunity, Propogation delay, Power dissipation),	03	
3	Mar	T I 24	DTL,TTL & CMOS logic.	03	
3		Unit III	Multivibrators and Flip Flops: Construction & working of Astable, monostable and Bistable transistorised multivibrators, RS, CK-RS, D, JK, JKMS and T Flip Flops (Logic	05	15
			diagram, Truth table, construction & working), Concept of edge trigger Flip-Flop, Concept of preset	05	
			& clear terminal.	05	
4	Mar-	Unit	Counters and Shift registers:		
	Apr	IV	Asynchronous & synchronous Counter, Up-down counters (up to 4-bits),	04	
			modified asynchronous counter (Mod -7, Mod10, and Mod-13). Types of shift registers,	03	15
			SISO, SIPO, PISO & PIPO, IC version of Mod -10 shift registers (Construction & working),	04	
			IC version of shift register – 7495, Application of shift register. Ring counter, Johnson's counter.	04	

## Class:-B.Sc. IstYear

### Semester:- II<sup>nd</sup>

			Semester II		
5	Apr- May	Unit V	Combinational logic circuit: Encoder: Binary to BCD, Decimal to BCD, IC 74147, Decoder: 2 to 4 line, BCD to decimal, BCD to 7 segment, IC 7447, Multiplexer: 4X1, 8X1, De multiplexer: 1X4, 1X8, (Definition, construction, operation and application of above)	05 02 03 05	15
6	Apr- May	Unit VI	Semiconductor Memories: Concept of memory, primary and secondary memory, classification of memories, volatile and non volatile memories, memory Hierarchy, semiconductor memory: RAM, ROM, PROM, EPROM, EEPROM, flash memory.	04 02 02	15

### Class:-B.Sc. II <sup>nd</sup> Year Semester:- III<sup>rd</sup>

### **Paper:- Electronics Devices and Circuits**

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
	Aug	Unit. I	Hybrid-parameters & Cascaded		
1			amplifiers:		
			Hybrid-parameters, transistor		
			equivalent circuit of CE,CB,		
			Analysis of small signal CE		15
			amplifiers,	07	10
			Concept of cascaded amplifier,	02	
			Types of coupling, RC Coupled		
			Amplifier, Single Tuned		
			amplifiers,	06	
2	Aug-	Unit II	Power Amplifier:		
	Sept		Classification of power amplifier, Class A, Class B, Class C and Class AB amplifiers, Class A - transformer coupled amplifier, Class-B	05	
			push-pull amplifier (Construction, working and efficiency of each).	05	15
			Distortion, complementary symmetry Class-B push- pull amplifier.	05	
3	Cont	Unit III	Foodback amplifions and Oscillators		
3	Sept		<b>Feedback amplifiers and Oscillators:</b> Concept of feedback, feedback theory, positive and	03	
			negative feedback,	0.5	15
			advantage of negative feedback, physical idea of feedback, (Block diagram only),	02	13
			concept of oscillator, basic elements of oscillator,	03 02	
			Barkhausen Criteria of oscillation, concept of tank circuit. RC oscillator-Phase shift and Wein bridge		
			oscillator, LC oscillator- Colpitts and Hartley	07	
4	Oct	Unit IV	oscillator, Crystal oscillator  Operational amplifier and applications:	07	
7	Oct	Cint I v	Difference amplifier(concept, construction and		
			working),	01	
			block diagram of operational amplifier, characteristics of ideal op amp, concept of virtual	03	
			ground, parameter of op amp output impedance,		15
			Applications: Op amp as inverting and non inverting amplifier, adder, Subtractor, Differentiator and Integrator.	1 1	

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	Nov.	Unit V	Advance applications of Op- Amp:		
5			Solution to simultaneous equation, differential		
			equation for harmonic, damped harmonic oscillator, regenerative	04	1.5
			comparator, logarithmic amplifier,	04	15
			Astable, Monostable and Bistable multivibrator and		
			its time period (construction and working).	07	
	Nov-	Unit	A/D and D/A converter:		
6	Dec	VI	Need of A/D and D/A converter.	02	
			D/A converter: R-2R ladder type, Weighted resistor,		
			sample and hold circuit,	04	15
			IC ADC, DAC specification.	02	
			A/D converter: Single and Dual slope, counter type, successive approximation type, specification,		
			Numerical based on A/D and D/A Converter	07	

### Class:-B.Sc. II<sup>nd</sup> Year Semester- IV<sup>th</sup>

### B.Sc. II <sup>nd</sup> Year Paper:- Communication Electronics and Microprocessor 8085

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan-	Unit. I	Modulation and Demodulation: Need for modulation, AM theory, Power relation,		
	Feb		Theory of FM,	03	
			Numerical on AM and AM Systems, frequency		
			spectrum of FM. Generation of AM and FM. Collector modulator,	03	15
			diode reactance modulator.	02	
			Demodulator: diode detector, slope detector.	03 02	
			Transmitter and receiver :Block diagram and working		
			of AM and FM transmitter and receiver.	04	
2	Feb-	Unit II	Fiber Optic Communication :		
	Mar		Introduction ,advantages of OFC , Types of fibers ,internal reflections ,numerical	02	
			aperature.	03	15
			Optical Sources: Semiconductor injection LASER,		
			LED ,(power and efficiency chacteristics).	04	
			Optical detectors : Photodiode , PIN diode ,		
			Phototransistor . Optical fiber connection : Jointer and coupler ,fiber	03	
			alignment and joint losses ,connector couplers.	03	
3	Mar	Unit III	Pulse Modulation and Digital Communication:		
			Pulse Modulation, Sampling Theorem PAM, PWM		
			,PPM and PCM (Bandwith of PCM ,Quantizing Noise ) ,	08	
			Application of PCM, Multiplexing Principles: TDM		15
			and FDM, Comparison of FDM and TDM.	07	
4	Mar-	Unit IV	Architecture and timings of 8085:		
	Apr		Evolution of microprocessor, microcomputer (Block		
	-		diagram with function of each block), architecture of Intel 8085 microprocessor, function of	03	
			each block of 8085, Functional pin diagram and		
			function of all pins of 8085, instruction format.	07	15
			Instruction cycle, fetch and execute operation,		
			machine cycle and state, timing diagram of MOV and MVI instructions.	05	
ے	Apr-	Unit V	Instruction and programming of 8085:		
5	May		Addressing mode, classification of instruction set of 8085 with examples, concept of stack and stack		
			pointer, PUSH and POP instruction,	0.4	
			Concept of subroutine: CALL and RET instruction,	04	
			Delay subroutine (using one register and register pair).	02 02	15
			Programming: Algorithm, Flowchart, Assembly and	02	
			machine language, assembly language program such as programme for addition, subtraction,		
			multiplication, division, finding maximum and	07	
			minimum numbers etc.		

## Class:-B.Sc. II nd Year

## Semester:- IV Paper: -:- Communication Electronics and Microprocessor 8085

Sr. No	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
6	May	Unit. VI	Interfacing:	02	
			Basic interfacing concept, memory mapped I/O and I/O		
			mapped I/O Schemes, data		
			transfer schemes.	03	
			8255PPI: block diagram,	03	15
			function of each block,		
			Functional pin diagram, ,		
			function of each pin, operating		
			modes of 8255PPI, control		
			word format in I/O and BSR mode, illustrative example.	10	

## Class:-B.Sc. III<sup>rd</sup> Year

### Semester-V<sup>th</sup>

### **Paper:-Measuring Instruments**

Sr.] No	Month	Unit	Name of Unit & Topics	Required Lect.	Tota Lect
	Aug	Unit. I	<b>Basic Instrumentation:</b>		
1			Block diagram of generalized instrumentation system, Concept of transducers (Primary and secondary, active and passive, analog and digital). Resistive transducer potentiometer, Inductive	05	15
			transducer - LVDT, capacitive transducer (by changing distance), measurement of displacement using capacitive transducer (By changing dielectric).	05	13
2	Aug-	Unit II	, ,	05	
2	Sept	Cint II	Measurement of Temperature: Thermocouple, Thermopile, Thermister, RTD, Total Radiation Pyrometer, IC DS 1621, IC LM34, IC LM35,	06 03 04	15
			Infrared Pyrometer,	02	
3	Sept	Unit III	Timer and PLL: IC 555 timer: Block diagram and function of each block, application of 555 timer as astable, bistable and monostable multivibrator (construction, working	02	
			and expression for time period). PLL Block diagram and function of each block, concept of capture range, pull in time, lock in range, electrical characteristics, applications of PLL as FM	07 04	15
			demodulator, AM detector and frequency synthesizer	04	
4	Oct	Unit IV	Display, digital Instrument		
			and ecorder:  Seven segment, 14 segment, dot matrix, 16x2 LCD display, advantage and disadvantage, Digital instrument: Digital frequency meter, Digital voltmeter (Ramp type), Digital capacitance meter (Block diagram and function of each block).  Recorder: Classification, necessity of recorder, XY recorder, magnetic tape recorder.	03 07 05	15
_	Nov.	Unit V	Sensors and Actuators:	00	
5			Sensors: Definition, Methods of fabrication of Sensors, Types of sensors (Mechanical, Thermal, Optical, magnetic, chemical) Actuators: Definition, Working principles of Electromechanical, Electro thermal, Electro-optical	08	15

	Nov.	Unit VI	Biomedical electronics:		
6			Introduction, Type of electrode, EEG, EMG, ECG- block diagram and function of each block, X ray machine, instantaneous heart rate meter-	06	
			systolic and diastolic blood pressure meter, EAR oximeter, pulse Oximeter, range gated pulse Doppler blood flow meter, Laser Doppler blood flow	03	15
			meter.	07	

### Class:-B.Sc. III<sup>rd</sup> Year Semester-VI<sup>th</sup>

Paper:- Advanced Microprocessor and Microprocessor

Sr. No.	Month	Unit	Name of Unit & Topics	Required Lect.	Total Lect.
1	Jan- Feb	Unit. I	8086 Architecture: Block diagram of 8086 microprocessor, BIU and EU, operating modes of 8086, register of 8086-G.P.R, pointer and index register, segment register, concept of segmented memory, instruction pointer, status flag, pin diagram of 8086 microprocessor, physical and effective address.	07 08	15
2	Feb- Mar	Unit II	Instructions and programming of 8086 Instructions: MOV, PUSH, POP, LEA, LDS, LES, Arithmetic & Logic Instructions. Addressing mode, 8086 instruction, Bus cycle, Programming: programs of data transfer, addition, subtraction, division, multiplication using various	04 03 08	15
3	Mar	Unit III	addressing mode.  8051 Microcontroller Architecture:  Microcontroller Introduction, Difference between  Microprocessor and Microcontroller,  block diagram of microcontroller, CPU, registers, flags,  PSW, PC, Data Pointer, SFR, SP,  Internal RAM/ROM, External memory, I/O ports, counter  & timers, interrupts.	05 05 05	15
4	Mar- Apr	Unit IV	Instruction set of 8051 and Programming:  Addressing mode, Instruction set: Data transfer, arithmetic, logical operation, JUMP, Loop and CALL instructions.  Assembly language programming examples: simple data transfer, arithmetic, logical and single bit.	08	15
5	Apr- May	Unit V	8051 Interfacing & Application: Basics of serial communication, interfacing with RS-232C, SCON and PCON registers, interfacing a DAC / ADC and waveform generation, interfacing to the 8255, interfacing LED, power reduction mode.	05 05 05	15

## Class:-B.Sc. III<sup>rd</sup> Year

# Semester-VI<sup>th</sup> Paper:- Advanced Microprocessor and Microprocessor

May Unit. Advance microcontroller:		
Introduction to AVR, Arithmetic and logic Unit, program and data memories, downloadable flash program memory, SRAM data memory, general purpose register file, I/O register, EEPROM data memory, peripherals, Timers/ Counters.	04 02 05 04	15